

CLAIMS

WE CLAIM:

1. A fluid administration system for the operation of a cylinder and piston assembly for actuating mechanisms, of the type including, in combination: a support frame; a centering ring mounted on the support frame; a cylinder centrally mounted on the centering ring, including an internal chamber and a piston into the chamber, having
5 piston rods to be coupled to the actuating mechanisms, a valve housing including a first, a second a third, a fourth and a five apertures, and operating valve means into the valve housing, having a first, a second, a third and a fourth connections, for coinciding with the apertures of the valve housing, for controlling the feeding and discharging of operating fluid to the piston and cylinder assembly;

10 the fluid administration system comprising:

a network of fluid feeding and discharging passages practiced at the cylinder, the centering ring and the support frame, to provide operating fluid to the cylinder and piston assembly for ascending and descending runs of the piston and allow the discharging of fluid from the cylinder and piston assembly; and

15 a passage network practiced at the cylinder cap, connected to the network of fluid admission and discharging passages, including speed-control valve means, at the passage network, to control the speed of discharging of fluid from the cylinder and piston assembly and the speed of the ascending and descending runs of the piston of the cylinder and piston assemblies.

2. The fluid administration system according to claim 1, wherein the operating valve means including a reel valve operated by a piloting fluid, and the speed-control valve means including needle valves, for controlling the speed of fluid discharging from the cylinder and piston assembly.

3. The fluid administration system according to claim 1, wherein the network of fluid feeding and discharging passages comprises:

a first fluid feeding conduit for feeding operating fluid to the cylinder and piston assembly, having a first end connected to a fluid source, for feeding fluid, and a second end;

a first fluid feeding passage passing through the centering ring and the cylinder, having a first end connected to the second end of the fluid feeding conduit, and a second end;

a second fluid passage passing through the cylinder, the centering ring and the support frame, having a first end and a second end;

a second conduit having a first end connected to the second end of the second fluid passage, and a second end connected to a lower part of the cylinder in communication with the internal chamber of the cylinder, for feeding fluid to the lower part of the chamber of the cylinder, under the piston, when the reel valve is in its upper operating aperture, for an ascending run of the piston, and for discharging of fluid from the lower part of the chamber of the cylinder, when the reel valve is in its lower operating aperture, for a descending run of the piston;

a piloting fluid passage passing through the support frame, the centering ring and the cylinder, for feeding a piloting fluid to the valve housing, in order to operate the valve means to an upper aperture;

a third fluid passage at the cylinder, having a first end and a second end connected in communication with an upper part of the cylinder; and

fourth and fifth fluid passages, all of which pass through the cylinder, the centering ring and the support frame, for passing and discharging of fluid from the cylinder.

4. The fluid administration system according to claim 1, wherein the second conduit is integrated to a wall of the cylinder as a passage having a first end connected to the second end of the second fluid passage, and a second end connected to a lower part of the cylinder in communication with the internal chamber of the cylinder.

5. The fluid administration system according to claim 1, wherein the passage network of the cylinder cap comprises:

a first passage, having a first end connected to the first fluid passage passing through of the centering ring and the cylinder, for feeding operating fluid to the chamber of the cylinder, and a second end leading to the third aperture of the valve housing, coinciding with the third connection of the reel valve into the valve housing, and a second passage, having a first end leading to the second aperture of the valve housing coinciding with the first connection of the reel valve of the valve housing, and a second end connected to the to the second passage passing through the cylinder, the centering ring and of the support frame, for feeding fluid, through the

second conduit, to the lower part of the cylinder in communication with the chamber of the cylinder under the piston, for an ascending run of the piston;

15 a third passage having a first end leading to the fourth aperture of the valve housing, and a second end connected to an intermediate portion including a first needle valve part of the cylinder in communication with the chamber of the cylinder over the piston, and having a first branch having a first end connected to the third passage by means of a check valve, and a second end leading to the upper part of the chamber of the cylinder, and a second branch including a first needle valve, having a first end connected to the third passage, and a second end leading also to the upper part of the chamber of the cylinder, for a controlled speed discharging of fluid over the piston, at an ascending run of the piston, when the reel valve is at an upper operating aperture, and for feeding fluid when the reel valve is in its lower operating aperture, for a descending run of the piston;

20 a fourth passage having a first end leading to a fifth aperture of the valve housing, an intermediate portion including a second needle valve, introduced through an opened top of the cylinder, and a second end connected to the first passage of the network of fluid feeding and discharging passages passing through the cylinder, the centering ring and the support frame, for a controlled speed discharging of fluid from the upper part of the chamber of the cylinder, over the piston, when the reel valve is in its upper operating aperture; and

25 a fifth passage having a first end leading to a first aperture of the valve chamber, an intermediate portion including a third needle valve introduced through an opened top of the cylinder and a second end connected to the second passage of the fluid feeding and discharging network of passages passing through the cylinder,

the centering ring and the mechanism support frame, for a controlled speed discharging of fluid from the lower part the chamber of the cylinder under the piston, when the reel valve is in its lower operating aperture.